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| 10/669,620 | 09/24/2003 | Daniel B. Roitman | 10030589-1 | 5622 |

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| EXAMINER |
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| JUNG, UNSU |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPOPS.LEGAL@agilent.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/669,620 | ROITMAN ET AL. | |
| | Examiner | Art Unit | |
| | UNSU JUNG | 1641 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-19,29,34 and 35* is/are pending in the application.

4a) Of the above claim(s) *5,15 and 19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-14,16-18,29,34 and 35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's amendments in the reply filed on July 21, 2008 have been acknowledged and entered. The reply included addition of new claims 34 and 35.

### *Status of Claims*

2. Claims 1-19, 29, 34, and 35 are pending, claims 5, 15, and 19 are withdrawn from consideration, and claims 1-4, 6-14, 16-18, 29, 34, and 35 are under consideration for patentability under 37 CFR 1.104.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. The following prior art rejection has been modified (**bolded passages**) due to addition of new claims 34 and 35 in the reply filed on July 21, 2008.

Claims 1, 2, 3, 7, 17, 18, 29, **34, and 35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. (U.S. Patent No. 6,908,737, Published on Jan. 9, 2003 and Filed on Oct. 19, 2000) in view of Henrichs (U.S. PG Pub. No. US 2003/0161245 A1, filed July 23, 2001).

With respect to claims 1 and 3, Ravkin et al. teaches a microbead particle system for bioassay comprising:

- at least one microparticle made of polymeric material (column 23, lines 42-45);

- a pattern encoded on at least one portion of said at least one microbead particle (column 20, lines 49-67), wherein the pattern is physically marked into a digital data layer of the microbead particle to reveal or block a reflective, photoluminescent or absorbing pattern (spatial coding), wherein the digital data layer cooperates with a transducing layer (carrier material) of the microbead particle to produce a detectable signal (column 10, line 1-65).
- a selected geometry effectively associated with said at least one microbead particle, said selected geometry capable, alone or with other artifacts, of identifying at least microbead particle (column 20, lines 49-67); and
- wherein the microbead particle is suitable for chemical conjugation with ligands (column 22, lines 46-67).

With respect to claim 2, Ravkin et al. teaches a microbead particle system, wherein the said polymeric material is polymethylacrylates (thermoplastic, column 11, lines 12-25) and organosilicon resins (column 15, lines 22-30).

With respect to claim 7, Ravkin et al. teaches a microbead particle system, wherein the pattern is symmetrical (Fig. 10B).

With respect to claim 17, Ravkin et al. teaches that teaches a microbead particle system, further comprising a first embossed polymeric material having a first inner surface opposing a first patterned surface and a second embossed polymeric material having a second inner surface opposing a second patterned surface, wherein the first

inner surface forms a bond with the second inner surface (column 10, lines 61-65 and Fig. 14).

With respect to claim 18, Ravkin et al. teaches a microbead particle system, further comprising means for marking said at least one microbead particle after binding with an analyte, said at least one microbead particle being identified by the emission of dyes or luminescent molecules associated with the analyte (column 27, lines 3-11).

However, Ravkin et al. fails to teach a microbead particle system, wherein the transducing layer is tellurium-containing films and the transducing layer produces a detectable binary data.

Henrichs teaches binary data comprising tellurium data-recording material layer (tellurium-containing films, see entire document, p48, particularly [0519]). An optical phase-change material is capable of being switched from one detectable state to another detectable state or states by the application of optical energy (p49, paragraph [0527]). The state of the phase-change material is detectable by properties such as, for example, index of refraction, optical absorption, optical reflectivity, or any combination thereof (p49, paragraph [0527]). Tellurium based materials have been utilized as phase-change media for data storage, where the change is evidenced by a change in a physical property such as reflectivity (p49, paragraph [0527]).

**With respect to claims 34 and 35, Henrichs teaches a tranducing layer (tellurium) overlying a digital layer (disk, p48, paragraph [0519]).**

Therefore, one of ordinary skill in the art at the time of the invention would have been motivated to employ the binary coding method of Henrichs, which includes use of

tellurium-containing films, in the microbead particle system of Ravkin et al. with a reasonable expectation of success since the method using tellurium-containing film for storing information in binary code format is well known in the coding arts and Ravkin et al. teaches that coding material on microbead particle system may be made in a wide array of colors, optical characteristics, and combinations of colors and optical characteristics (column 10, lines 7-9). In addition, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to select an appropriate coding scheme including the transducing layer comprising tellurium-containing films, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). See MPEP § 2144.07. Because the claimed system is known in the prior art and has been disclosed to include a wide array of colors, optical characteristics, and combinations of colors and optical characteristics for encoding transducing layer of microbead particle system in general, the selection of a specific type of encoding scheme in itself does not present a novel feature of the claimed invention. Since one of ordinary skill in the art at the time of the invention would recognize that the system of Ravkin et al. can employ be a wide array of colors, optical characteristics, and combinations of colors and optical characteristics for encoding transducing layer of microbead particle system for variety of coding schemes, it would have been obvious to apply binary coding method of Henrichs, which includes use of tellurium-containing film,

in the microbead particle system of Ravkin et al. with a reasonable expectation of success.

According to the current specification (p5), the microbead particle of claim 1 formed by the method recited in claim 29. MPEP states that the lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972). Ravkin et al. teaches a microbead particle system for bioassay as discussed above. However, Ravkin et al. fails to teach a microbead particle system, wherein the pattern encoded on at least one portion of the microbead particle generates a diffractive image.

7. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. (U.S. Patent No. 6,908,737, Published on Jan. 9, 2003 and Filed on Oct. 19, 2000) in view of Henrichs (U.S. PG Pub. No. US 2003/0161245 A1, filed July 23,

2001) as applied to claim 1 above, and further evidenced by .Kolesar, Jr. et al. (U.S. Patent No. 4,906,440, Mar. 6, 1990).

Ravkin et al. in view of Henrichs teaches a microbead particle system for bioassay as discussed above. Further, Ravkin et al. teaches a microbead particle system further comprising at least one layer of material, silicon nitride (column 15, lines 33-38) on polymeric material.

With respect to claim 6, Ravkin et al. teaches a microbead particle system, wherein said at least one layer of material includes at least one surface suitable for chemical conjugation with a ligand (column 22, lines 46-67).

Although Ravkin et al. in view of Henrichs is silent on disclosing that the silicon nitride is a dielectric material, one of ordinary skill in the art at the time of the invention would have recognized that the silicon nitride is a dielectric material as evidenced by Kolesar, Jr. et al. (column 8, line 8).

8. Claims 8-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. (U.S. Patent No. 6,908,737, Published on Jan. 9, 2003 and Filed on Oct. 19, 2000) in view of Henrichs (U.S. PG Pub. No. US 2003/0161245 A1, filed July 23, 2001) as applied to claims 1 and 7, and further in view of Tompkin et al. (U.S. Patent No. 5,754,520, May 19, 1998).

Ravkin et al. in view of Henrichs teaches a microparticle system for bioassay as set forth above.

With respect to claim 13, Ravkin et al. teaches a pre-selected geometry associated with the microbead particle (column 20, lines 35-40). With respect to the recitation of "wherein the said geometry enables seating in a receiving substrate in a manner effective for particle identification", enabling seating in a receiving substrate in a manner effective for particle identification is an inherent property of the pre-selected geometry associated with the microbead particle.

With respect to claim 14, Ravkin et al. teaches that the pre-selected surface shape and size is triangles, circles, or squares (column 5, lines 49-56), wherein said pre-selected surface shape is used in combination with color dyes (column 9, lines 43-44). With respect to the recitation of "said treatment creating an interferometric or holographic color pattern", creating an interferometric or holographic color pattern is an inherent property of said pre-selected surface shape with color dye treatment.

However, Ravkin et al. in view of Henrichs fails to teach a microbead particle system, wherein the pattern encoded on at least one portion of the microbead particle generates a diffractive image.

Tompkin et al. teaches a method of using diffraction grating patterns as optical data carriers (Abstract). In the simplest case, the diffraction pattern is a diffraction grating with a symmetrical or asymmetrical profile shape, which diffracts light predominantly in two or single direction, respectively (column 12, lines 1-4). Diffraction pattern of one profile shape (one unit cell) can represent value "1" and the other (second unit cell) can represent "0" so that information can be stored in multiple number of unit cells, which represents a plurality of bits (column 12, lines 1-40).

With respect to the recitation of claims 8-10, "wherein said pattern is capable of generating a diffractive image", generating a diffractive image is an inherent property of diffraction grating patterns of Tompkin et al. upon illumination.

With respect to claim 9, Tompkin et al. teaches a diffraction grating pattern comprising at least one unit cell, which is being repeated (column 12, lines 1-40).

With respect to claim 11, Tompkin et al. teaches a diffraction grating pattern comprising plurality of regions (unit cell), which is capable of producing a plurality of electromagnetic responses.

With respect to the recitation of claims 11 and 12 "wherein said pattern is capable of producing a plurality of electromagnetic responses, wherein the plurality of electromagnetic responses is selected from the group consisting of reflectivity, light absorption, and photoluminescence", producing a plurality of electromagnetic responses such as reflectivity, light absorption, and photoluminescence is an inherent property of diffraction grating patterns of Tompkin et al. upon illumination an electromagnetic source.

With respect to claim 16, Tompkin et al. teaches that the pattern represents ridges and troughs (Fig. 5) corresponding to constructive and destructive interference patterns. With respect to the recitation of "a relationship between said ridges and troughs being a function of refractive index of said polymeric material, refractive index of a medium through which the depth of said pattern is measured, and the wavelength of light impinging on said pattern", the ridges and troughs being a function of refractive index of said polymeric material, refractive index of a medium through which the depth

of said pattern is measured, and the wavelength of light impinging on said pattern is an inherent property of the polymeric material of the microbead particle having patterns of ridges and troughs.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the optical coding method of Tompkin et al., which comprises use of symmetrical and asymmetrical diffraction grating patterns that are capable of generating diffractive images, in the microbead particle system of Ravkin et al. in view of Henrichs in order to use binary code to encode the microbead particle system. Combining diffraction grating coding method of Tompkin et al. with the coding methods of Ravkin et al. in view of Henrichs is advantageous as additional coding method would provide increased repertoire of different types of codes to distinguish the microbead particle system of Ravkin et al. in view of Henrichs with a reasonable expectation of success as the methods of generating and reading diffraction grating pattern is done on polymeric surface is well known in the art of optical coding applications.

## ***Response to Arguments***

9. Rejection of claims 1, 2, 3, 7, 17, 18, and 29 under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. in view of Henrichs

Applicant's arguments filed on July 21, 2008 have been fully considered but they are not persuasive essentially for the reasons of record and arguments addressed herein.

Applicant's argument that Ravkin et al. does not disclose a transducing layer has been fully considered but is not found persuasive essentially for the reasons of record. As stated in the previous Office Action dated April 17, 2008 (see item 9), Ravkin et al. teaches a microbead particle system for bioassay with encoded patterns (see entire document, particularly column 10, lines 1-65). The encoded patterns can be provided by a carrier comprising a sandwich of individually discernable layers, which may differ in color, refractive index, reflectivity, shade, or texture (column 20, lines 49-56). Therefore, the prior art reference of Ravkin et al. contemplates use of sandwich of discernable layers differing in reflectivity. Therefore, the carrier layer of Ravkin et al. includes a layer having a defined reflectivity (a transducing layer) cooperating with a digital data layer (another layer having a different reflectivity) to product a detectable data signal.

Applicant's argument that the Examiner is attempting to read both the particle made of polymeric material and the transducing layer on the carrier material has been fully considered but is not found persuasive essentially for the reasons of record. Ravkin et al. teaches that various different coding means can be employed in combination (column 10, lines 7-9). Ravkin et al. teaches that microbead particles can be discernable by size, density, granularity, refractive index, color, fluorescence, or may contain yet another carrier or carriers that are further discernable (column 23, lines 30-33) and that the microbead particles can be made of polymeric material (column 23, lines 42-45). Therefore, Ravkin et al. contemplates that the polymeric microbead particles may further include additional carriers (such as sandwich of layers having

different reflective layers as set forth above) that are further discernable and distinct from the polymeric carrier of the microbead particle.

Applicant's argument that Ravkin et al. does not disclose or suggest producing a detectable binary data signal has been fully acknowledged as the previous Office Action dated April 17, 2008 (see item 9) clearly states that Ravkin et al. fails to teach that the transducing layer produce a detectable binary data. Further, applicant's argument that Ravkin et al. teaches away from producing a detectable binary data signal because Ravkin et al. discloses that greater information content is achieved with fewer coding positions using spectrally coded carriers compared to the traditional binary bar code formats has been fully considered but is not found persuasive. Contrary to applicant's argument that Ravkin et al. teaches away from the claimed invention, it is noted that a prior art reference may be considered to teach away when "a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the appellant." See *In re Haruna*, 249 F.3d 1327, 58USPQ2d 1517 (Fed. Cir. 2001). Further, in contrast to applicant's assertions disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. See *In re Susi* USPQ 423 (CCPA 1971). A known or obvious composition does not patentable simply because it has been described as somewhat inferior to some other product for the same use. See *In re Gurley* 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). See MPEP 2123. Although, Ravkin et al. teaches that greater information content is achieved with fewer coding positions using

spectrally coded carriers compared to the traditional binary bar code formats, there is no skepticism or discouragement in the prior art for employing binary data for uses that do not require the use of large encoding a large library of compounds.

In view of the foregoing response to arguments, the rejection of claims 1, 2, 3, 7, 17, 18, and 29 under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. in view of Henrichs have been maintained.

10. Rejection of claims 4 and 6 under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. in view of Henrichs, and further evidenced by .Kolesar, Jr. et al.

Applicant's arguments filed on July 21, 2008 have been fully considered but they are not persuasive essentially for the reasons of record and arguments addressed above.

In view of the foregoing response to arguments, the rejection of claims 4 and 6 under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. in view of Henrichs, and further evidenced by .Kolesar, Jr. et al. have been maintained.

11. Rejection of claims 8-14 and 16 under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. in view of Henrichs, and further in view of Tompkin et al.

Applicant's arguments filed on July 21, 2008 have been fully considered but they are not persuasive essentially for the reasons of record and arguments addressed above.

In view of the foregoing response to arguments, the rejection of claims 8-14 and 16 under 35 U.S.C. 103(a) as being unpatentable over Ravkin et al. in view of Henrichs, and further in view of Tompkin et al. have been maintained.

12. Since the prior art fulfills all the limitations currently recited in the claims, the invention as currently recited would read upon the prior art.

***Prior Art of Record***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Rijnsburger (U.S. Patent No. 4,907,216, Mar. 6, 1990) teaches a binary coding method, which includes a substrate being coated with a thin metal layer such as tellurium (see entire document, particularly Fig. 1b and column 3, lines 4-30). The thin metal layer is radiated to give another reflection coefficient for binary encoding (column 3, lines 4-30).
- Clark (Networks and Telecommunications: Design and Operation, 2nd edition, Data and the Binary Code System, 1997, John Wiley & Sons Ltd., pp43-53) teaches that the advantage of binary code system is the ease with which binary numbers can be electrically (see entire document, particularly p44, last paragraph).

***Conclusion***

14. No claim is allowed.

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to UNSU JUNG whose telephone number is (571)272-8506. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Shibuya can be reached on 571-272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Unsu Jung/
Unsu Jung
Patent Examiner
Art Unit 1641